

***ADVANCE-ENG With PURPOSE:
Grand Challenges and Great Solutions***



Professor Christine S. Grant

Associate Dean Faculty Development & Special Initiatives: College of Engineering

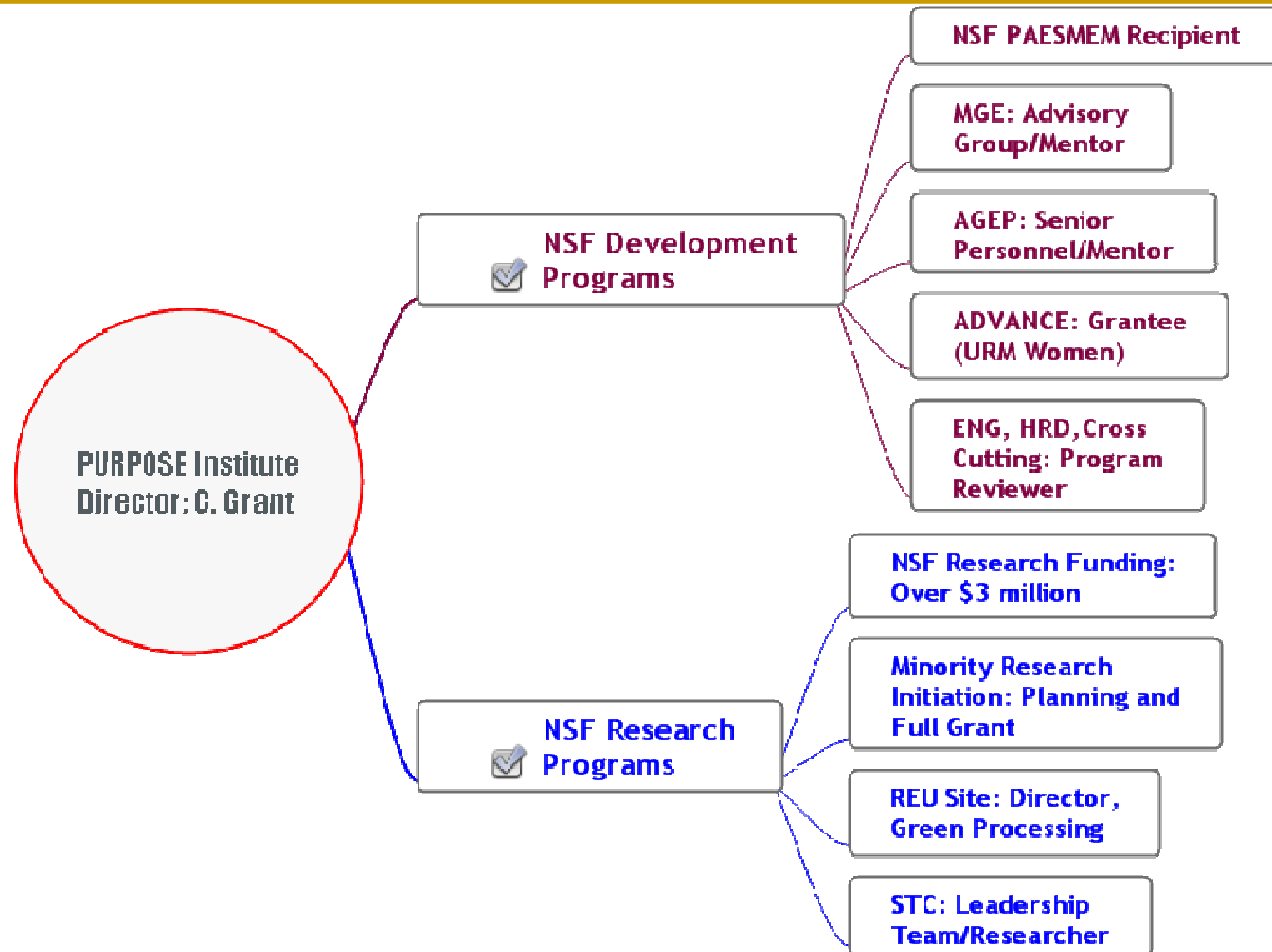
Professor: Department of Chemical and Biomolecular Engineering (CBE)

North Carolina State University

Raleigh, North Carolina



Broadening Participation an NSF Legacy.....



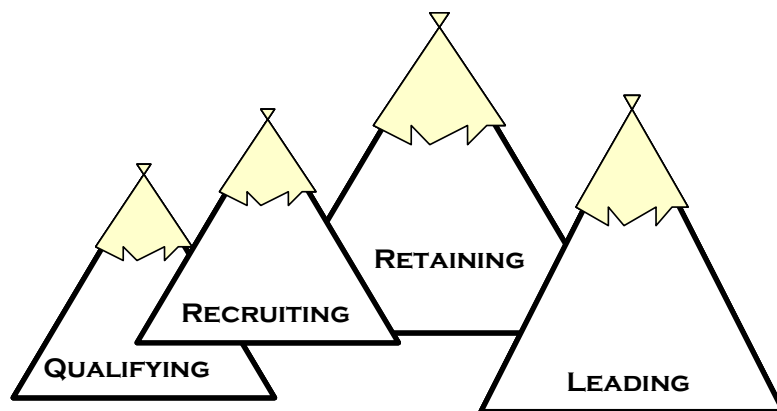
NSF Sponsored ADVANCE Leadership Award

Principal Investigators: Christine S. Grant PhD, Jessica DeCuir-Gunby, PhD

NSF ADVANCE Leadership 0545269

Goals

- Increase the number of Underrepresented Minority (URM) women faculty in Science and Engineering
- Create venues and environment to stimulate candid discourse on experiences and successes in moving through the ranks, addressing critical issues in race and gender in STEM disciplines
- Build global database of URM women faculty in Science and Engineering for purposes of networking and collaboration
- Improved retention and promotion into leadership of URM women faculty
- Assess and evaluate outcomes for publication



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- **1st summit-** NCSU in Raleigh, NC, 2007: over 60 women at all academic ranks *focused on cross-cultural mentoring* and the role of *top fifty* institutions.
- **2nd summit-** NCSU in Raleigh, NC, 2009: featured over 30 senior URM women engineering faculty as a *catalyst for creating a strong peer leadership mentoring network* and the initial *development of a cohesive community serving as a powerful resource in the academy*.
- **3rd summit-** California Institute of Technology, 2009: The culminating summit focused on women at all faculty ranks. *Designed to pass on the depth of wisdom gleaned from Senior Women Engineering Leaders* from the Spring 2009 Summit, and *empower women URM faculty through a series of interactive sessions*. Summit featured *active mentoring* by senior leadership and brainstorming activities to collectively solidify the critical voices and associated leadership roles they play in national areas such as the Engineering Grand Challenges, workforce, global technological needs, and university governance.
- All summits cultivated the formation of a network of peers celebrating accomplishments, sharing strategies for success, and raising the bar even higher for all in the academy.



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Summit Highlights

- First time convening of target group to glean from each other the tools of success in the academy, 2007.
- Outreach: 75 nationally established URM women engineering professors provided critical connection for 70 URM middle school girls to view themselves as future engineering professors, 2007.
- **ADVANCE Profiles in Leadership Summit at NCSU, 2009.** 30 senior women faculty from 20 colleges & universities across US , Puerto Rico & Virgin Islands attended
- Candid dialog between women and NCSU administration; focus on critical issues ; NCSU departmental visits and connections
- Mentoring, networking, collaborating, and celebrating groundwork laid for next summit of faculty of all ranks
- **ADVANCE Summit at California Institute of Technology, Summer 2009** 60+ women representing 47 colleges & universities, 25 US States, Puerto Rico, and British Columbia attended
- Mentoring, network & collaboration, professional development, information sharing; Caltech departmental visits and connections and networking meals



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Summit Highlights

- Presidents Roundtable Discussion, Q&A: candid dialog w/three University Presidents: Brown (Simmons), UC San Diego (Fox), Caltech (Chameau).
- University Administration Panels: Caltech (Tirrell, Hunt), NCSU (Martin-Vega)
- Outreach: NSF-AGEP Collaboration Lunch with URM
- Graduate and Undergraduate



**Promoting Underrepresented Presence on Science and Engineering Faculties
(PURPOSE) Institute**

*"Institutional Changing Administrative/Faculty
Collaborative Partnerships"*



PURPOSE Institute Mission Statement

"To significantly increase the number and success of URM engineering and science faculty utilizing innovative programs that facilitate strategic institutional partnerships promoting URM faculty recruitment, promotion, retention and leadership."

Support: NSF, NCSU, CASEE/NAE

Goals

Partnerships: To stimulate collaborative efforts between senior URM faculty and university admin. to promote success of URM faculty in engin. and sci.

Events: Advocate strategic initiatives enabling institutions to succeed in URM faculty recruitment/ retention. Coordinate professional development programs to celebrate & empower current & aspiring faculty.

Major Deliverable: Establish Best Practices Guide for recruitment, promotion and retention of URM faculty based on career info from successful faculty and administrative leaders.

Organization: Establish strong coordinating infrastructure to facilitate productive development with and for key stakeholders. Achieve excellence in Institute operations

Mentoring: Advance development of peer mentoring communities for URM faculty. Capture and disseminate best practices in cross cultural faculty mentoring.

Advisory Group

Dr. Ansley Abraham,

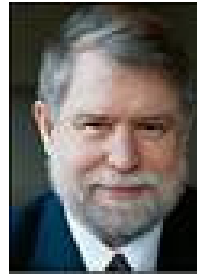
Director of the State
Doctoral Scholars
program of the Southern
Regional Education
Board (SREB);



Dr. Frank Huband,

Executive Director of the
American Society for
Engineering Education

(ASEE);



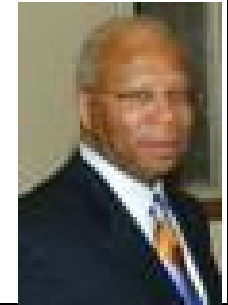
Dr. Shirley Ann Jackson,

President of Rensselaer
Polytechnic Institute;



Dr. James Johnson,

Dean of Howard
University College of
Engineering;



Dr. Eloy Rodriguez,

James A. Perkins
Endowed Professor of
Biology and
Environmental Studies at
Cornell University



Dr. David Wormley,

Dean of Engineering at
Pennsylvania State
University



Dr. William Wulf,

Former President of the
National Academy of
Engineering



The PURPOSE Institute



Institutional Administration +



**Underrepresented Minority
(URM) Faculty +**



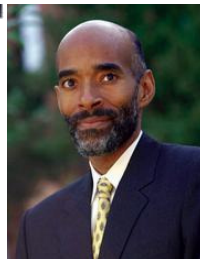
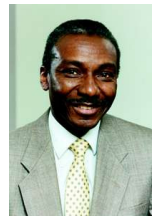
URM Students +



URM K-12 Students +



Kristina Johnson,
Pratt School of Engineering dean



Integrating the Pipeline.....

PURPOSE Beneficiaries

Students- Potential students from an increasingly diverse population will view colleges of science and engineering as a top field that **values diversity**. Students will gain external faculty role models, mentors, and potential graduate school advisors.

Faculty - Benefits for faculty include: (a) **Mentors** for URM junior faculty; (b) **Research Collaborators** for all STEM faculty on large interdisciplinary centers or education proposals; (c) seminar guest speakers; (d) Graduate student **pipeline**.

Administrators - Benefits to Administrators include: (a) Senior URM faculty **Think Tank** as a resource **for search committees** (b) Access to a diverse faculty candidate pool; (c) Network of **visible** senior URM faculty to mentor junior faculty.

Industry - Industry will also see the value colleges of engineering place on diversity as being aligned with their companies **core values** and guidelines for donating.

PURPOSE Institute : Continuing to Thrive



NC STATE UNIVERSITY

History and Accomplishments

- Created vision in 2004
- Formed an advisory group of nationally recognized STEM leaders
- Held five national think tank summits in the 2005-2006 year
- Developed a *strategic* plan, core staff, and communication vehicles
- Established *collaborative* relationships with national agencies
- Built industry connections and obtained verbal commitments of Institute support from major corporations
- Conducted educational research on best practices
- Reached over **400** constituents from the three targeted URM communities: faculty (100+), students (300+), and administration (50+)
- Awarded over **\$50K** in funding for use through FY 2006 exclusively for Institute development

Future Events and Funding

- Partnerships and sponsorships with industry supporters
- Interactions with 100+ women engineering faculty during three summits over the next three years
- Presentations to **100+ engineering deans** during engineering deans institute
- Contact with engineering faculty during the NAE/CASEE and Frontiers in Education meeting
- Introduction of the Institute to interested audiences and organizations to generate interest in future joint activities
- Publication of *best practice* literature geared toward specific populations
- Creation of *mentoring network* for benefit of three targeted communities
- Awards totaling **\$393,000** for exclusive use over the next three years for Institute development and project execution

PURPOSE Institute Developmental Activities

Interdisciplinary Think Tank: A Initial “Fact-Finding” Summit (June 2005, NAE)

Actions:

- **Identify the various department head groups** and ascertain when they meet as a group. Set up a defined time on their agenda to present findings of think tank and summit groups.
- **Utilize a specific, targeted set of questions** to glean from the department heads and deans what their major issues are with the hiring, support and development of faculty of color.
- **Initiate dialog to identify action items and strategies** to implement to increase the presence of this important sector of the academy.
- **Identify underrepresented minorities that are in leadership positions** in the academy to discern most effective approach to systematic change in the academy. Using this group as a resource will enable this group to bridge the gap in terms of the language and tenor of the discussion.

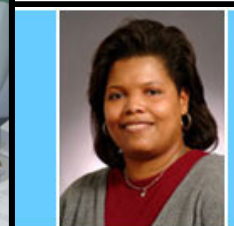
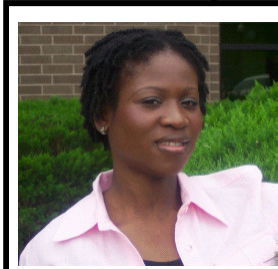
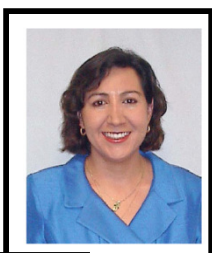


Underrepresented Minority ChE Women Faculty Summit

(July 21-24, 2005; NCSU, Raleigh, NC)



We identified three areas that governed the discussion groups and working sessions. The Summit actively worked on qualifying women for promotion in academe, recruiting women in the pipeline to faculty positions, retaining women in faculty positions and equipping the women to pursue leadership positions.



Synergistic Initiatives

"Minority CHE Faculty 2001+:"

A workshop to develop minority leaders in the CHE Academy

A 2-day Professional Development Workshop
Sun, March 4, 2001 – Tuesday, March 6, 2001



Co-Sponsored by:

NSF Division of Chemical and Transport Systems
AIChE – Minority Faculty Forum / Minority Affairs Committee (MAC)

Key Components of the Program

- 1) Panel Discussions
- 2) Research Presentations and Poster Sections
- 3) Meetings with NSF and other program officers
- 4) Overview presentations of research funding opportunities at NSF
- 5) Presentation/Discussions of results of Participant Career Development Survey
- 6) Structured Opportunities for Mentoring and Collaboration

Over 60 current and prospective faculty participants!!

Exciting NSF Workshop Follow-up Development Activities:

2004: NSF Workshop for Interdisciplinary Engineering Faculty Group

Over 90 current and prospective faculty participants!!

•2006 (Planned): NSF Workshop for Interdisciplinary Science/ Engineering Faculty Group

Over 90 current and prospective faculty participants!!

C.S. Grant - 2005

Recommendations of PURPOSE.....

- ***Must:*** Engage and Incorporate the *voices and experiences of success* into next generation of NSF programs & national STEM efforts. Establish real relationships with *institutional administrators* facilitating best practices development.
- ***Need:*** National broadening participation initiative to provide a *interactive interface* between URM students and faculty; maintaining student success and promoting faculty advancement in context of tenure system.
- ***Need:*** Significant NSF Funding for *National Level Interdisciplinary* Program that includes builds on the success of faculty beneficiaries of NSF programs... *to rise above the storm!*
- ***Support:*** *Center level initiative* to maximize AGEP, NSF Research Center, Informal Science Education and other HRD programs – providing opportunities for personnel interface.



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